What is claimed is:

1. A chamber for holding an object at a pressure that is lower inside the chamber than outside the chamber, comprising:

walls and at least one bulkhead that collectively define the chamber;

a secondary wall situated outside the chamber relative to the bulkhead and defining a gap between the secondary wall and the bulkhead, the gap defining a secondary reduced-pressure chamber that is maintained at a pressure that is lower than the pressure outside the chamber, and the secondary wall being deformable relative to the bulkhead in response to a differential of pressure inside the secondary reduced-pressure chamber relative to the pressure outside the chamber.

2. The chamber of claim 1, wherein the secondary reduced-pressure chamber is isolated from the pressure outside the chamber and from the pressure inside the chamber.

3. The chamber of claim 1, wherein:

the chamber is configured to be evacuated to a vacuum level relative to atmospheric pressure outside the chamber; and

the secondary reduced-pressure chamber is connected to a vacuum pump configured to evacuate the secondary reduced-pressure chamber to a pressure that is lower than the atmospheric pressure outside the chamber.

4. The chamber of claim 1, further comprising:

a measurement instrument mounted to the bulkhead and having a portion extending through the secondary wall to outside the chamber; and

seal means situated and configured to seal the secondary wall to the measurement instrument while allowing the secondary wall to move relative to the measurement instrument, without breaching the seal, in response to the differential of pressure.

5. The chamber of claim 4, wherein the measurement instrument is configured to measure a characteristic of the object inside the chamber.

6. The chamber of claim 4, wherein the seal means comprises an elastomeric sealing member extending from the secondary wall to the measurement instrument.

7. The chamber of claim 4, wherein:

the chamber is a wafer-vacuum chamber of a microlithography system;

the object is a semiconductor wafer being processed lithographically in the wafer-vacuum chamber; and

the measurement instrument is configured for measuring at least one of position and alignment of the semiconductor wafer inside the wafer-vacuum chamber.

8. The chamber of claim 4, wherein:

the chamber is a reticle-vacuum chamber of a microlithography system;

the object is a reticle; and

the measurement instrument is configured for measuring at least one of position and alignment of the reticle inside the reticle-vacuum chamber.

9. The chamber of claim 1, wherein:

the pressure inside the chamber is at a vacuum level; and

the pressure inside the secondary reduced-pressure chamber is a higher vacuum level than inside the chamber.

10. The chamber of claim 1, wherein:

the pressure inside the chamber is at a vacuum level; and

the pressure inside the secondary reduced-pressure chamber is a respective vacuum level that is intermediate the vacuum level inside the chamber and the pressure outside the chamber.

11. The chamber of claim 1, configured as a wafer-vacuum chamber or reticle-vacuum chamber in a microlithography system.

12. An apparatus for housing an object in a subatmospheric-pressure environment, comprising:

a chamber collectively defined by vessel walls and at least one bulkhead, the chamber being sized to contain the object and to contain an atmosphere evacuated to the subatmospheric pressure;

at least one instrument mounted to the bulkhead outside the chamber, the instrument being configured to measure a characteristic of the object in the chamber; and

a deformation-reducing device for reducing deformation of the bulkhead in response to a pressure differential of the subatmospheric pressure inside the chamber relative to pressure outside the chamber.

13. The apparatus of claim 12, wherein:

the deformation-reducing device comprises a secondary wall situated outside the chamber relative to the bulkhead and defining a gap between the bulkhead and the secondary wall; and

the gap defines a secondary reduced-pressure chamber that is evacuated to a pressure that is lower than the pressure outside the chamber.

14. The apparatus of claim 13, wherein the secondary wall is configured to deform relative to the bulkhead in response to the pressure differential of the pressure inside the secondary reduced-pressure chamber relative to the pressure outside the chamber.

15. The apparatus of claim 13, further comprising seal means situated between and establishing a seal between the secondary wall and the instrument, the

seal means allowing the secondary wall to move relative to the instrument in response to the differential of pressure, without breaching the seal.

16. The apparatus of claim 15, wherein the seal means comprises an elastomeric sealing member extending from the secondary wall to the measurement instrument.

17. The apparatus of claim 15, wherein:

the instrument is mounted to an instrument-mounting member mounted to the bulkhead; and

the seal means comprises an elastomeric sealing member extending from the secondary wall to the instrument-mounting member.

18. The apparatus of claim 13, further comprising a vacuum pump connected to the secondary reduced-pressure chamber and configured to evacuate the secondary reduced-pressure chamber to the respective pressure in the secondary reduced-pressure chamber.

19. The apparatus of claim 12, further comprising a stage situated inside the chamber and configured to hold the object inside the chamber.

20. The apparatus of claim 19, wherein:

the object is a reticle or substrate; and

the stage is a reticle stage or a wafer stage, respectively, of a microlithographic projection-exposure system.

21. The apparatus of claim 20, wherein the instrument is selected from a group consisting of reticle-autofocus devices, reticle-alignment devices, wafer-autofocus devices, and wafer-alignment devices.

22. A system for irradiating an object with an energy beam, comprising:

a chamber collectively defined by vessel walls and at least one bulkhead, the chamber being sized to contain the object for irradiation with the energy beam and to contain an atmosphere evacuated, at least during the irradiation, to a subatmospheric pressure;

an optical system situated so as to irradiate the object in the chamber with the energy beam;

an instrument, mounted to the bulkhead outside the chamber, configured to measure a characteristic of the object in the chamber; and

a deformation-reducing device for reducing deformation of the bulkhead in response to a differential of pressure inside the chamber relative to pressure outside the chamber.

23. The system of claim 22, wherein:

the deformation-reducing device comprises a secondary wall situated outside the chamber relative to the bulkhead and defining a gap between the bulkhead and the secondary wall; and

the gap defines a secondary reduced-pressure chamber that is evacuated to a pressure that is lower than the pressure outside the chamber.

24. The system of claim 23, wherein the secondary wall is configured to deform relative to the bulkhead in response to a differential of pressure inside the secondary reduced-pressure chamber relative to the pressure outside the chamber.

25. The system of claim 23, further comprising seal means situated between and establishing a seal between the secondary wall and the instrument, the seal means allowing the secondary wall to move relative to the instrument in response to the differential of pressure, without breaching the seal.

26. The system of claim 25, wherein the seal means comprises an elastomeric sealing member extending from the secondary wall to the measurement instrument.

27. The system of claim 25, wherein:

the instrument is mounted to an instrument-mounting member mounted to the bulkhead; and

the seal means comprises a closure member extending from the secondary wall to the instrument-mounting member, and an elastomeric sealing member extending from the closure member to the instrument-mounting member.

28. The system of claim 23, further comprising a vacuum pump connected to the secondary reduced-pressure chamber and configured to evacuate the secondary reduced-pressure chamber to the respective subatmospheric pressure.

29. The system of claim 22, wherein:

the object is a lithographic wafer substrate; and

the optical system is a projection-optical system situated relative to the chamber and configured to illuminate and expose the substrate inside the chamber with an energy beam.

30. The system of claim 29, wherein the energy beam is selected from the group consisting of electromagnetic-radiation beams and charged particle beams.

31. The system of claim 22, wherein:

the object is a reticle; and

the optical system is an illumination-optical system situated relative to the chamber and configured to illuminate the reticle inside the chamber with an energy beam.

32. The system of claim 31, wherein the energy beam is selected from the group consisting of electromagnetic-radiation beams and charged particle beams.

33. A lithographic exposure system for exposing a substrate with a pattern, the system comprising:

a first chamber collectively defined by respective chamber walls and at least one respective bulkhead, the first chamber being configured (a) to contain the substrate for exposure, (b) to allow irradiation of the substrate with an energy beam capable of imprinting the pattern on the substrate, and (c) to contain an atmosphere evacuated, at least during the exposure, to a respective subatmospheric pressure;

a source of the energy beam situated relative to the first chamber to direct the energy beam into the first chamber to expose the substrate;

a respective instrument mounted to the respective bulkhead, the instrument being configured to measure a characteristic of the substrate in the first chamber; and

a respective deformation-reducing device for reducing deformation of the bulkhead of the first chamber in response to a differential of pressure inside the first chamber relative to pressure outside the first chamber.

34. The system of claim 33, wherein the instrument is configured to measure at least one of position and alignment of the substrate in the first chamber.

35. The system of claim 33, wherein the source comprises a projection-optical system coupled to the bulkhead of the first chamber.

36. The system of claim 35, further comprising a second chamber collectively defined by respective chamber walls and at least one respective bulkhead, the second chamber being configured (a) to contain a reticle, (b) to allow irradiation of the reticle with an illumination beam, (c) to allow the illumination beam, propagating downstream of the reticle, to pass from the second chamber to the

first chamber, and (d) to contain an atmosphere evacuated, at least during exposure, to a respective subatmospheric pressure;

an illumination-optical system situated relative to the second chamber and configured to direct the illumination beam into the second chamber to illuminate the reticle;

a respective instrument mounted to the respective bulkhead outside the second chamber, the instrument being configured to measure a characteristic of the reticle in the second chamber; and

a respective deformation-reducing device for reducing deformation of the bulkhead of the second chamber in response to a differential of pressure inside the second chamber relative to pressure outside the second chamber.

37. The apparatus of claim 36, wherein, with respect to the second chamber, the respective instrument is configured to measure at least one of position and alignment of the reticle in the second chamber.

38. The system of claim 36, wherein, with respect to the second chamber:

the deformation-reducing device comprises a respective secondary wall situated outside the second chamber relative to the respective bulkhead and defining a gap between the respective bulkhead and the respective secondary wall; and

the gap defines a respective secondary reduced-pressure chamber that is evacuated to a subatmospheric pressure that is lower than the pressure outside the second chamber.

39. The system of claim 38, wherein, with respect to the second chamber, the respective secondary wall is configured to deform relative to the respective bulkhead in response to a differential of pressure inside the respective secondary reduced-pressure chamber relative to the pressure outside the second chamber.

40. The system of claim 38, further comprising, with respect to the second chamber, respective seal means situated and establishing a seal between the

respective secondary wall and the respective instrument, the seal means allowing the respective secondary wall to move relative to the respective instrument in response to the differential of pressure, without breaching the seal.

41. The system of claim 40, wherein, with respect to the second chamber, the seal means comprises an elastomeric sealing member extending from a surface of the respective secondary wall to the instrument.

42. The system of claim 38, further comprising a vacuum pump connected to the secondary reduced-pressure chamber of the second chamber and configured to evacuate the secondary reduced-pressure chamber to the respective subatmospheric pressure.

43. The system of claim 42, wherein, with respect to the second chamber, the vacuum pump is further configured to change the subatmospheric pressure in the respective secondary reduced-pressure chamber in response to a change in pressure outside the second chamber.

44. The system of claim 36, wherein:

the projection-optical system comprises a first end coupled to the bulkhead of the first chamber;

the projection-optical system has a second end coupled to the bulkhead of the second chamber; and

the illumination beam passes from the reticle in the second chamber through the projection-optical system to the substrate in the first chamber.

45. The system of claim 33, wherein, with respect to the first chamber:

the deformation-reducing device comprises a respective secondary wall situated outside the first chamber relative to the respective bulkhead and defining a gap between the respective bulkhead and the respective secondary wall; and

the gap defines a respective secondary reduced-pressure chamber that is evacuated to a subatmospheric pressure that is lower than the pressure outside the first chamber.

46. The system of claim 45, wherein, with respect to the first chamber, the respective secondary wall is configured to deform relative to the respective bulkhead in response to a differential of pressure inside the respective secondary reduced-pressure chamber relative to the pressure outside the first chamber.

47. The system of claim 45, further comprising, with respect to the first chamber, seal means situated and establishing a seal between the respective secondary wall and the respective instrument, the seal means allowing the respective secondary wall to move relative to the respective instrument in response to the differential of pressure, without breaching the seal.

48. The system of claim 47, wherein, with respect to the first chamber, the seal means comprises an elastomeric sealing member extending from a surface of the respective secondary wall to the instrument.

49. The system of claim 45, further comprising a vacuum pump connected to the secondary reduced-pressure chamber of the first chamber and configured to evacuate the secondary reduced-pressure chamber to the respective subatmospheric pressure.

50. The system of claim 49, wherein, with respect to the first chamber, the vacuum pump is further configured to change the subatmospheric pressure in the respective secondary reduced-pressure chamber in response to a change in pressure outside the first chamber.

51. In a method for holding processing a workpiece under a subatmospheric-pressure condition established within a chamber collectively defined

by vessel walls and at least one bulkhead, a method for reducing deformations of the bulkhead resulting from changes in a differential of pressure inside the chamber relative to pressure outside the chamber, the method comprising:

placing a secondary wall outside the chamber relative to the bulkhead so as to define a gap between the secondary wall and the bulkhead, the gap defining a secondary reduced-pressure chamber; and

evacuating the secondary reduced-pressure chamber to a subatmospheric pressure that is lower than the pressure outside the chamber, wherein the secondary wall deforms relative to the bulkhead in response to a differential of pressure inside the secondary reduced-pressure chamber relative to the pressure outside the chamber.

52. The method of claim 51, wherein the pressure in the secondary reduced-pressure chamber is lower than the pressure inside the chamber.

53. The method of claim 51, wherein the pressure in the secondary reduced-pressure chamber is intermediate the pressure inside the chamber and the pressure outside the chamber.

54. A microlithography system that illuminates a selected region on a pattern-defining reticle with an energy beam, and projects and focuses the energy beam, propagating from the reticle, onto a selected region on a sensitive substrate so as to transfer the pattern from the reticle to the sensitive substrate, the microlithography system comprising:

a reticle-vacuum chamber containing a reticle stage on which the reticle is mounted, the reticle-vacuum chamber being defined by respective walls and at least one respective bulkhead;

a wafer-vacuum chamber containing a wafer stage on which the sensitive substrate is mounted, the wafer-vacuum chamber being defined by respective walls and at least one respective bulkhead;

a respective instrument mounted on the bulkhead of the reticle-vacuum chamber and configured to measure a characteristic of the reticle;

a respective instrument mounted on the bulkhead of the wafer-vacuum chamber and configured to measure a characteristic of the substrate; and

a deformation-reducing device for reducing deformation of the respective bulkhead of at least one of the chambers in response to a differential of pressure inside the respective chamber relative to pressure outside the respective chamber.

55. The system of claim 54, wherein:

the deformation-reducing device comprises a respective secondary wall situated outside the respective chamber relative to the respective bulkhead and defining a gap between the respective bulkhead and the respective secondary wall; and

the gap defines a respective secondary reduced-pressure chamber that is evacuated to a respective subatmospheric pressure that is lower than the pressure outside the respective chamber.

56. The system of claim 55, wherein the pressure in the respective secondary reduced-pressure chamber is lower than the pressure inside the respective chamber.

57. The system of claim 55, wherein the pressure in the respective secondary reduced-pressure chamber is intermediate the pressure inside the respective chamber and the pressure outside the respective chamber.

58. The system of claim 55, wherein the secondary wall is configured to deform relative to the respective bulkhead in response to a differential of pressure inside the respective secondary reduced-pressure chamber relative to pressure outside the respective chamber.

59. The system of claim 55, wherein the respective secondary reduced-pressure chamber further comprises seal means situated and establishing a seal between the respective secondary wall and the respective instrument, the seal means allowing the respective secondary wall to move relative to the respective instrument in response to the differential of pressure, without breaching the seal.

60. The system of claim 59, wherein the seal means comprises an elastomeric sealing member extending from a surface of the secondary wall to the respective instrument.

61. The system of claim 55, further comprising a respective vacuum pump connected to the secondary reduced-pressure chamber and configured to evacuate the secondary reduced-pressure chamber to the respective subatmospheric pressure.

62. The system of claim 54, comprising a first deformation-reducing device for reducing deformation of the bulkhead of the reticle-vacuum chamber, and a second deformation-reducing device for reducing deformation of the wafer-vacuum chamber, in response to respective pressure differentials being established in the respective chambers relative to outside the respective chambers.

63. The system of claim 62, wherein each deformation-reducing device comprises:

a respective secondary wall situated outside the respective chamber relative to the respective bulkhead and defining a respective gap between the respective bulkhead and respective secondary wall; and

each respective gap defines a respective secondary reduced-pressure chamber that is evacuated to a respective subatmospheric pressure that is lower than the pressure outside the respective chamber.

64. The system of claim 63, wherein each secondary wall is configured to deform relative to the respective bulkhead in response to a differential of pressure inside the respective secondary reduced-pressure chamber relative to pressure outside the respective chamber.

65. The system of claim 63, wherein each deformation-reducing device further comprises a respective seal means situated and establishing a seal between each respective secondary wall and the respective instrument, the seal means allowing the respective secondary wall to move relative to the respective instrument in response to the respective differential of pressure, without breaching the respective seal.

66. The system of claim 65, wherein each seal means comprises an elastomeric sealing member extending from a surface of the respective secondary wall to the respective instrument.

67. The system of claim 66, further comprising a respective vacuum pump connected to the respective secondary reduced-pressure chamber and configured to evacuate the respective secondary reduced-pressure chamber to the respective subatmospheric pressure.

68. The system of claim 63, wherein:

the respective instrument mounted on the bulkhead of the reticle-vacuum chamber is selected from the group consisting of reticle-position-measurement systems and reticle-alignment-measurement systems; and

the respective instrument mounted on the bulkhead of the wafer-vacuum chamber is selected from the group consisting of substrate-position-measurement systems and substrate-alignment-measurement systems.

69. The system of claim 62, wherein the bulkhead of the reticle-vacuum chamber and the bulkhead of the wafer-vacuum chamber are mounted to opposite

respective ends of a projection-optical system extending between and outside the chambers.

70. The system of claim 69, wherein:

the bulkhead of the reticle-vacuum chamber is configured as a reticle-optical plate; and

the bulkhead of the wafer-vacuum chamber is configured as a wafer-optical plate.

71. The system of claim 69, wherein:

the reticle-vacuum chamber comprises a second respective bulkhead situated opposite the respective bulkhead relative to the respective walls; and

the second bulkhead is connected to an illumination-optical system.

72. The system of claim 54, wherein:

the reticle-vacuum chamber is coupled to a reticle-loader chamber and a reticle load-lock chamber; and

the wafer-vacuum chamber is coupled to a wafer-loader chamber and a wafer load-lock chamber.

73. A chamber for holding an object, comprising:

walls and at least one bulkhead means that collectively define the chamber that contains an atmosphere at a respective pressure; and

deformation-reducing means for reducing deformation of the bulkhead means in response to a pressure differential of the pressure inside the chamber relative to pressure outside the chamber.

74. The chamber of claim 73, wherein:

the deformation-reducing means comprises secondary-wall means situated outside the chamber relative to the bulkhead means and defining a gap between the bulkhead means and the secondary-wall means;

the gap defines secondary-reduced-pressure-chamber means in which a respective pressure is lower than the pressure outside the chamber; and

the secondary-wall means deforms relative to the bulkhead means in response to a pressure differential of the pressure inside the secondary-reduced-pressure-chamber means relative to the pressure outside the chamber.

75. The chamber of claim 74, further comprising:

instrument means mounted to the bulkhead means outside the chamber; and

seal means for establishing a seal between the secondary-wall means and the instrument means, and allowing the secondary-wall means to move relative to the instrument means, in response to the pressure differential, without breaching the seal.